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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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6449 7590 09/03/2010 ROTHWELL, FIGG, ERNST & MANBECK, P.C. 1425 K STREET, N.W. SUITE 800 WASHINGTON, DC 20005				
EXAMINER ARCIERO, ADAM A				
ART UNIT 1795		PAPER NUMBER		
NOTIFICATION DATE 09/03/2010		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary

Application No.

10/572,935

Applicant(s)

HAMBITZER ET AL.

Examiner

ADAM A. ARCIERO

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-16 and 19-49 is/are pending in the application.
- 4a) Of the above claim(s) 10-16, 20-29 and 49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-9, 19 and 30-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ ~~Notice of Informal Patent Application~~
- 6) ☐ Other: _____

ELECTROCHEMICAL BATTERY CELL

Examiner: Adam Arciero S.N. 10/572,935 Art Unit: 1795 August 25, 2010

DETAILED ACTION

5. The Applicant's amendment filed on June 01, 2010 and supplemental amendment filed on June 14, 2010 was received. Claims 1, 6-7, 9 and 19 have been amended. Claims 2 and 17-18 have been canceled. Claims 37-49 are newly added.

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

5. Newly submitted independent claim 49 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The subject matter of the aforementioned claims is an electrochemical battery cell comprising a negative electrode, an electrolyte containing a conductive salt, a positive electrode, and an insulator means for permitting active mass deposited on the negative electrode during the charging of the cell to come into contact with the positive electrode in such a way that locally limited short-circuit reactions occur at its surface, wherein the electrolyte is based on SO₂, which is a distinct species from an electrochemical cell comprising a porous insulator layer which runs adjacent and parallel to the positive electrode, as recited in the original claims.

Since applicant has received an action on the merits for the originally presented

invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 14-21 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

6. The objections to claims 1-9, 17-19 and 30-34 are withdrawn in light of Applicant's arguments.

Claim Rejections - 35 USC § 112

7. The claim rejections under 35 U.S.C. 112, second paragraph, on claims 17-19 as being indefinite are withdrawn, because Applicant has canceled claims 17-18 and arguments for claim 19 are persuasive.

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 19 and 38-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In amended claim 19, on lines 7-4, Applicant recites: "the cell further

containing an electrode having an electrode surface which is essentially free of hydroxide ions.” The present specification supports a cell comprising a negative electrode, an electrolyte containing a conductive salt, and a positive electrode, wherein one of the electrodes has a surface which is essentially free of hydroxide ions. However, the specification does not provide support for a cell comprising a positive and negative electrode with an electrolyte containing a conductive salt, and further comprising another electrode (third electrode that is different from the positive and negative electrodes) which has a surface that is essentially free of hydroxide ions. Therefore, claim 19 contains new matter.

Claim Rejections - 35 USC § 102

10. The claim rejections under 35 U.S.C. 102(b) as being anticipated by Hambitzer et al. on claims 1, 3-6 and 30-34 are maintained. The rejections over amended claim 19 are withdrawn in light of Applicant’s amendments to the claim.

11. Claims 1-6, 17-19 and 30-34 and 37-48 are rejected under 35 U.S.C. 102(b) as being anticipated by Hambitzer et al. (WO 00/79631 using US 6,730,441 B1 as English equivalent).

As to Claim 1, Hambitzer et al. discloses a battery comprising a negative electrode having an active mass deposited thereon in the charged state, positive electrode and an electrolyte based on SO₂ (Abstract). Hambitzer et al. further discloses a separator (porous insulator structure) which is placed between said positive and said negative electrodes (intermediate space; runs adjacent and parallel to said electrodes) (col. 7, lines 1-6). The active metal is deposited on the negative electrode and is removed therefrom during the

charge/discharge process, respectively, thereby passing through the porous insulating layer (separator) (col. 7, lines 7-14). Furthermore, with respect to the pore size, the porous layer should be formed and arranged such that the active mass formed at the negative electrode during charging of the cell, penetrates into the pores of the separator (col. 5, lines 25-40). Said active mass will fill and pass through the pore structure to the interface of the positive electrode and the porous separator layer. Hambitzer et al. does not specifically disclose that locally limited short-circuit reactions occur at the surface of the positive electrode and the porous insulator. However, it is the position of the Examiner that such properties are inherent, given that the materials and structure disclosed by Hambitzer et al. and the present application are the same. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999). Applicant is advised to submit other information with respect to the Hambitzer et al. porous insulator layer, if it is shown to be patentably distinct from the instant invention.

As to Claims 3-4, Hambitzer et al. disclose wherein the negative electrode takes in the active metal ions during charging of the cell (col. 7, lines 7-14). Furthermore, said negative electrode comprises an electronically conductive electrode mass (col. 7, lines 1-14).

As to Claim 5, Hambitzer et al. disclose wherein said negative electrode comprises carbon (col. 7, lines 7-14).

As to Claims 6 and 46, Hambitzer et al. disclose a deposition layer comprising a carrier body (glass or ceramics) and additional salt provided in the pores of the carrier body (col. 5, lines 25-32).

As to Claims 30-31, Hambitzer et al. disclose wherein the active metal is lithium, sodium, calcium or zinc (col. 1, lines 20-26).

As to Claim 32, Hambitzer et al. disclose wherein the positive electrode comprised a metal oxide (col. 4, lines 10-12).

As to Claims 33-34, Hambitzer et al. disclose wherein the positive electrode contains an intercalation compound of CoO_2 (col. 4, lines 25-32).

As to Claim 37, Hambitzer et al. do not specifically disclose wherein the electrode of claim 19 is essentially free of H^+ ions. However, it is the position of the Examiner that such properties are inherent, given that the materials and structure of the battery of Hambitzer et al. and the present application are the same. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities of possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999). Applicant is advised to submit other information with respect to the Hambitzer et al. electrode, if it is shown to be patentably distinct from the instant invention.

Claim Rejections - 35 USC § 103

12. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Hambitzer et al. on claims 7-8 are maintained. The rejections are repeated below for convenience.

As to Claim 7, Hambitzer et al. disclose a separator made of an oxide (col. 7, lines 7-14). Hambitzer et al. does not specifically disclose the pore shapes of the separator (insulator layer). Furthermore, the courts have held that regarding changes in shape of the pores of the insulator

would be obvious absent persuasive evidence that the particular configuration of the claim was significant. See *In re Dailey*, 357 F.2d 669, 149, USPQ 47 (CCPA 1966).

As to Claim 8, Hambitzer et al. disclose wherein the separator is an oxide (col. 7, lines 7-14).

13. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Hambitzer et al. and Groebel et al. on claim 9 is maintained. The rejection is repeated below for convenience.

As to Claim 9, Hambitzer et al. does not specifically disclose wherein the porous insulator contains a binder based on a terpolymer of tetrafluoroethylene, hexafluoropropylene and vinylidene fluoride.

However, Groebel et al. teach the use of a separator comprising aluminum oxide further comprising a binder of polytetrafluoroethylene (col. 3, line 66 to col. 4, line 6). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the separator of Hambitzer et al. with a binder such as “Teflon”, because Groebel et al. teach that said separator can be bonded to an electrode by using such a binder.

14. Claims 19, 38-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hambitzer et al. (WO 00/44061 using US 6,709,789 B1 as an English equivalent) in view of Gavelin et al. (US 6,596,440 B2).

As to Claim 19, Hambitzer et al. discloses a secondary battery comprising a positive electrode, a negative electrode and an electrolyte containing a conductive salt, said electrolyte being based on SO₂ (abstract and col. 2, lines 46-61). Hambitzer et al. does not specifically

disclose wherein an electrode has an electrode surface which is essentially free of hydroxide ions.

However, Gavelin et al. teaches of a secondary battery that focuses on solving a problem associated with passivation phenomena at the electrode surfaces (col. 4, lines 13-17). Gavelin et al. teaches it is important to reduce the growth of the passivation films which in turn results in improved battery performance when the electrolyte is applied to the battery (col. 5, lines 39-56). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the battery of Hambitzer et al. by reducing the growth of passivation films at the electrode surfaces, because Gavelin et al. recognizes that such films decrease performance of lithium secondary batteries. Furthermore, it is the position of the Examiner that properties such as the electrode surfaces being free of hydroxide ions are inherent, given that the materials and structure of the battery of Hambitzer et al. and Gavelin et al. and the present application are the same. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities of possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

As to Claims 38-39, Hambitzer et al. discloses wherein the electrode comprises an active metal (col. 2, lines 61-45). Hambitzer et al. does not specifically disclose an insertion electrode and further an intercalation electrode.

However, Gavelin et al. teaches of a secondary battery comprising a negative electrode having metal materials or graphite (insertion/intercalation electrode) (col. 11, lines 27-43). At the time of the invention, it would have been obvious to one of ordinary skill in the art to substitute the graphite electrode for the negative electrode of Hambitzer et al., because Gavelin

teaches that it is a well known type of negative electrode in a secondary battery, and a recognized equivalent to those disclosed in Hambitzer et al.

As to Claims 40-42, Hambitzer et al. and Gavelin et al. teach an electrode comprising carbon that is capable of taking up positive metal ions of a conductive salt into its interior during charging of the cell (col. 1, lines 4-14).

As to Claim 43, Hambitzer et al. discloses wherein the electrolyte is a tetrahalogenated aluminate of an alkali metal (col. 2, lines 62-67).

As to Claim 44, Hambitzer et al. does not specifically disclose wherein the positive electrode is essentially free of H^+ ions.

However, Gavelin et al. teaches of a secondary battery that focuses on solving a problem associated with passivation phenomena at the electrode surfaces (col. 4, lines 13-17). Gavelin et al. teaches it is important to reduce the growth of the passivation films which in turn results in improved battery performance when the electrolyte is applied to the battery (col. 5, lines 39-56). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the battery of Hambitzer et al. by reducing the growth of passivation films at the electrode surfaces, because Gavelin et al. recognizes that such films decrease performance of lithium secondary batteries. Furthermore, it is the position of the Examiner that properties such as the electrode surfaces being free of hydroxide ions are inherent, given that the materials and structure of the battery of Hambitzer et al. and Gavelin et al. and the present application are the same. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities of possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

As to Claim 45, Hambitzer et al. and Gavelin et al. does not specifically disclose wherein the electrode contains at most 5000ppm of chemically bonded water. However, it is the position of the Examiner that such properties are inherent, given that the materials and structure of the battery of Hambitzer et al. and the present application are the same. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities of possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999). Applicant is advised to submit other information with respect to the Hambitzer et al. electrode, if it is shown to be patentably distinct from the instant invention.

As to Claim 46, Hambitzer et al. ('789) discloses a deposition layer comprising a carrier body (glass or ceramics) and additional salt provided in the pores of the carrier body (col. 3, lines 15-30).

As to Claim 47, Hambitzer et al. ('789) discloses wherein the porous insulator layer is formed such that, during charging of the cell, active mass deposited on the negative electrode will penetrate into the pores of the structure (col. 3, lines 15-30). The active mass will penetrate to the opposite surface of the porous structure (the positive electrode/electrolyte interface).

As to Claim 48, Hambitzer et al. ('789) discloses wherein the porous insulator layer is configured to and capable of permitting growth of active metal therethrough ((col. 3, lines 15-30).

Response to Arguments

15. Applicant's arguments filed on June 01, 2010 have been fully considered but they are not persuasive.

Applicant's principle arguments are:

a) the phrases "arranged and adapted to" further structurally limits the claimed battery cell (claim 1).

b) The rejection of claim 1 is improper because Examiner did not consider the "intermediate space" feature (claim 1).

c) Hambitzer et al '631 does not disclose that "in intermediate space between the positive electrode and the negative electrode is arranged and adapted such that active mass deposited on the negative electrode during charging of the cell may come into contact with the positive electrode" (claim 1).

d) Hambitzer '631 does not teach a porous insulating layer that has pores that permit active mass to grow therethrough, but does teach a separator which prevents active mass from growing therethrough (claim 1).

e) Hambitzer '631 includes a conventional separator which is designed to prevent growth of active matter from the negative electrode to the positive electrode (claim 1).

f) Examiner did not fully consider the limitations of claim 6 (claim 6).

g) Hambitzer does not disclose the pore shapes and it is further non-obvious to have the claimed pore shapes (claims 7 and 8).

In response to Applicant's arguments, please consider the following comments:

a) The phrase “phrase arranged and adapted to” does not further limit the structure of the claim. The phrase states a capable function of the battery cell where the active mass may come into contact with the positive electrode so that locally limited short circuit reactions occur. The present specification states that the pore size and pore structure of the porous insulating structure is what allows the insulating layer to perform the specific, unique functions. See MPEP 2114. “while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function.” *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).

b) Examiner did consider the intermediate space feature. The intermediate space is the interface between the electrode and the porous insulator layer, which is present on all batteries comprising these layers.

c) Hambitzer et al. ('441 and '789) does disclose a porous insulating layer which is formed between the positive and negative electrodes (intermediate space). Hambitzer further teaches that with respect to the pore size, the porous layer should be formed and arranged such that the active mass formed at the negative electrode during charging of the cell, penetrates into the pores of the separator (col. 5, lines 25-40). Thus, as said active mass fills and passes through the pore structure, some of the active mass will be found in the pores on the interface of the positive electrode and the porous separator layer, thereby causing locally-limited short circuit reactions.

d) Hambitzer et al. ('441 and '789) teaches that with respect to the pore size, the porous layer should be formed and arranged such that the active mass formed at the negative electrode

during charging of the cell, penetrates into the pores of the separator (col. 5, lines 25-40). The porous layer of Hambitzer et al. '441 is materially and structurally the same as that claimed in claim 1 and therefore is capable of performing the same.

e) Hambitzer '441 discloses the same porous insulator layer as the present application, where the pore sizes and structure thereof are arranged to allow active mass penetrate into its pores from the negative electrode to the positive electrode (col. 5, lines 25-40).

f) Examiner did consider the structural limitations of claim 6. Furthermore, Hambitzer et al. '631' teaches of a porous insulator layer which is capable of having active mass penetrate into its pores and is deposited further therein (col. 5, lines 25-40).

g) Hambitzer teaches the same insulator layer as the present application comprising a pore structure to allow active mass to move therethrough (col. 5, lines 25-40). Hambitzer teaches it would be obvious to change the formation of the pore structure and the courts have also held changes of shape and size to be obvious. The claimed pore shapes are common pore shapes found within porous structures made of particles or fibers. The present specification does not provide any basis for forming the specific pore shapes that would lead one of ordinary skill in the art to the novelty of the different pore shapes.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 1795

/Adam A. Arciero/

Examiner, Art Unit 1795

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1795